2011 BOUT++ Workshop

Lawrence Livermore National Laboratory September 14-16, 2011

Program of BOUT++ Workshop

7:00	Shuttle bus leaves from hotel to LLNL on Sept 14
8:00	Shuttle bus leaves from hotel to LLNL on Sept 15 and 16
8:30 – 9:00	QA
9:00 – 10:30	Morning Session
10:30 – 11:00	Coffee break
11:00 – 12:30	Morning Session
12:30 – 14:00	Lunch
14:00 – 15:30	Afternoon Session
15:30 – 16:00	Coffee break
16:00 – 17:40	Afternoon Session
17:40	Shuttle bus leaves from LLNL to hotel

Returns badges at the end of the 3rd day or when finishing attending the workshop.

Day 1: Overview and Setting up BOUT++

7:15 - 9:30	Badging, Setup Wireless Accounts
9:30 - 9:40	Welcome, Don Correll
9:40 - 9:50	Workshop Agenda and Logistics, Xueqiao Xu
Session 1	Overview and Introduction, Chair, Tom Rognlien
9:50 – 10:20	Introduction and Overview of BOUT++ Code, Ben Dudson
10:20 – 10:50	Status of BOUT++ Simulations, Xueqiao Xu
10:50 – 11:00	Coffee break
Session 2	Setting up BOUT++, Chair, Francois Waelbroeck
11:00 – 11:30	Downloading, Compiling, and Running BOUT++, Sean Farley
11:30 – 12:00	A Brief Overview of PETSc Capabilities that can be employed by BOUT++, Hong Zhang
12:00 – 12:30	Overview of the BOUT++ Code Structure, Ben Dudson

12:30 – 14:00	Lunch at the Central Cafeteria

Day 1: Lab exercises 1: Basic BOUT++ Example Simulations

Session 3: **Drift Instability or Interchange Mode**
14:00 – 14:30   Hands-on Running Examples, Maxim Umansky
14:30 – 15:30   Lab Exercises

15:30 – 16:00   Coffee break

Session 4: **Post-processing and Analysis Tools**
15:30 – 16:00   Hands-on Running Examples, Maxim Umansky
16:00 – 17:40   Lab Exercises

Day 2: Solvers

8:30 – 8:45   Questions/Answers 1, Sean Farley / Maxim Umansky

Session 1:   Solvers and Numerical Schemes,
                  Chair, Lois Curfman McInnes
8:45 – 9:15   Available Solvers in BOUT++ Package, Ben Dudson
9:15 – 9:45   SUNDIALS Solver Packages, Carol Woodward
9:45 –10:30   Physics Based Preconditioners,
                  Oakridge National Lab., Luis Chacon

10:30 – 11:00   Coffee break

Session 2:   Solvers and Numerical Schemes-continued,
                   Chair, Lois Curfman McInnes
11:00 – 11:30   BOUT++ Performance Analysis, Praveen Narayanan
11:30 – 12:00   hypre Solver Packages, Rob Falgout

12:00 – 12:30   Discussion 1, Extending BOUT++ Performance: Solvers,
                  Time Integration, Preconditioning, Numerical Issues,
                  Scalability
                  Lois Curfman McInnes

12:30 – 14:00   Lunch at the Central Cafeteria

Day 2: Lab exercises: ELMs

Session 3:   **Advanced BOUT++ ELM Simulations, Chair, Phil Snyder**
14:00 – 14:30   Hands-on Running Examples --- ELMs, Xueqiao Xu
14:30 – 15:30   Lab Exercises

15:30 – 16:00   Coffee break

Session 4:   **ELMs-cont.**
16:00 – 16:30   Hands-on Running Examples --- Getting Equilibria into
                   BOUT++ and Running ELM Cases, Ben Dudson
16:30 – 17:30   Lab Exercises

Day 3 morning: Turbulence, and GYRO-Fluids

Session 1:   **Gyro-fluid Extensions, Bill Nevins**
 8:30 – 9:00   Overview of Gyro-fluid models Phil Snyder
 9:00 – 9:30   Nonlinear FLR phase-mixing effect on Gyro-fluid results
(remote),

                   Bill Dorland
 9:30 – 10:00   Gyro-fluid Simulations using TRB Code, SS Kim
10:00 – 10:30   Discussion 2, Gyro-fluid Extension of BOUT++ Code

10:30 – 11:00   Coffee break

Session 2:   **BOUT++ Applications in Turbulence Simulations**
                   Chair, Maxim Umansky
11:00 – 11:30   BOUT++ Simulations of Edge Turbulence in the Alcator C-
                   Mod Tokamak, Evan Davis, MIT
11:30 – 12:00   LAPD Simulations, Brett Friedman, UCLA

12:00 – 12:30   Discussion 3, Chair, Tom Rognlien
                   • How to divide up the work needed to improve
                     BOUT++ to extend its range of applications;
                   • How to establish a set of tests before commit
                     additions and modifications in repository

12:30 – 13:15   Lunch at the Central Cafeteria

13:15 – 15:00   ***NIF Tour & Group Photo 1:00pm to 2:30pm***

Day 3 afternoon: Turbulence in Tokamaks and Summary

Session 3:   **Discussion 4,** Chair, Tom Rognlien
15:00 – 15:15   Presentation on the code and where improvements are needed, Ben Dudson

15:15 – 15:45   Discussion of future work and how tasks will be divided for ELM and RMP simulations

15:45 – 16:00   Coffee Break

Session 4:   **Linear Machines**
16:00 – 16:30   Hands-on Running Examples ---Linear Machines**,**   Brett Friedman
16:00 – 17:30   **Lab Exercises**

Close

Tutorial Lecturers: Ben Dudson, Sean Farley, Lois Curfman McInnes, Maxim Umansky, Xueqiao Xu, Hong Zhang

Special lecturers: Luis Chacon, Bill Dorland, Rob Falgout, Phil Snyder, Francois Waelbroeck, Carol Woodward

Lab exercises tutors: Justin Angus, Brett Friedman, Ilon Joseph, Tianyang Xia